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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,239	12/03/2003	Jean-Paul Mardon	12928/100021	7506

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EXAMINER	
ROE, JESSEE RANDALL	
ART UNIT	**PAPER NUMBER**
1742	

DATE MAILED: 12/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/728,239	MARDON ET AL.	
	Examiner	Art Unit	
	Jessee Roe	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-3 remain for examination wherein claims 1 and 2 are amended.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 26 September 2006 has been entered.

Status of Previous Rejections

The previous rejection of claim 1-3 under 35 U.S.C. 102(b) as being anticipated by Lunde et al. (US 4,212,686) is withdrawn in light of the Applicant's amendments to the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mardon et al. (US Patent 5,648,995) in view of Sabol et al. (US 4,649,023) and

Rebeyrolle et al. (US 5,832,050).

In regards to claims 1-3, Mardon et al. ('995) disclose (abstract) a zirconium based alloy that is made into tubing sheaths (sheet) for nuclear fuel rods as shown in the following table.

Element	From Instant Claims	Mardon et al. ('995)	Overlapping range
Fe	must be present	50 - 250 ppm	50-250 ppm
Cr	-	-	-
V	-	-	-
Fe+Cr+V	200 - 700 ppm	50 - 250 ppm	200 - 250 ppm
Nb	0.8%-1.3%	0.8%-1.3%	0.8%-1.3%
C	less than 100 ppm	less than 200 ppm	0 - 100 ppm
S	10 - 35 ppm	-	-
Si	less than 50 ppm	less than 120 ppm	0 - 50 ppm
O	1100 -1700 ppm	less than 1600 ppm	1100 - 1600 ppm
Zr	remainder	remainder	remainder

Mardon et al. ('995) disclose the elements as shown in the table above, but Mardon et al. ('995) do not disclose adding chromium or vanadium to the zirconium-based alloy.

Sabol et al. ('023) disclose (col. 2, lines 45-68 and col. 1, lines 1-35)) disclose adding chromium or vanadium in amount of up to 0.25% to zirconium-based alloys that are made into tubing for nuclear reactors. The addition of chromium or vanadium provides a higher corrosion resistance (col. 2, lines 45-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add chromium or vanadium in an amount of up to 0.25%, as disclosed by Sabol et al. ('023), to the zirconium-based alloy that is made into tubing for nuclear rods, as disclosed by Mardon et al. ('995), in order to obtain a higher corrosion resistance.

Mardon et al. ('995) disclose the elements as shown in the table above and Mardon et al. ('995) in view of Sabol et al. ('023) disclose the addition of vanadium or chromium, but neither Mardon et al. ('995) nor Mardon et al. ('995) in view of Sabol ('023) disclose adding sulfur to the zirconium-based alloy.

Rebeyrolle et al. ('050) disclose adding sulfur in an amount between 8 ppm and 100 ppm to zirconium-based alloys made into tubing sheaths for nuclear reactors (abstract and col. 8, lines 1-30). The addition of sulfur in the range of 8-100 ppm provides improvement of the creep, uniform corrosion, and nodular corrosion behaviors (col. 8, lines 1-30).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add sulfur in an amount of 8 ppm to 100 ppm, as disclosed by Rebeyrolle et al. ('050), to the zirconium-based alloy that is made into tubing for nuclear fuel rods, as disclosed by Mardon et al. ('995) or Mardon et al. ('995) in view of Sabol et al. ('023), in order improve the creep, uniform corrosion, and nodular corrosion behaviors, as disclosed by Rebeyrolle et al. ('050).

The ranges disclosed by Mardon et al. ('995) in view of Sabol et al. ('023) and Rebeyrolle et al. ('050) for iron, niobium, carbon, silicon, oxygen, vanadium or chromium, sulfur and zirconium for a zirconium-based alloy are within the ranges of the claimed invention. The Examiner notes that the disclosed elemental compositions of the zirconium based alloy overlap with the elemental compositions of the claimed invention. Therefore, a prima facie case of obviousness exists. See MPEP 2144.05 I.

In regard to the claimed content of tin, silicon, and carbon, claim language "or less" indicates that their content values may be zero in references used. As for tin and the references applied, this has been treated as so.

The Examiner asserts that the greater part of the iron would be in the form of $Zr(Nb,Fe,Cr)_2$ or $Zr(Nb,Fe,V)_2$ with an intermetallic compound size of 200 nm or less in the invention of Mardon et al. ('995) in view of Sabol et al. ('023) and Rebeyrolle et al. ('050) because the disclosed process of Mardon et al. ('995) compared to that of the instant invention are substantially similar as shown below (MPEP 2112 III):

	Mardon et al. ('995) (col. 3, lines 1-40)	**Instant Invention**
1st Step	quenching after heating to 1050°C	quenching after heating to 1000-1200 °C
2nd Step	extruding after heating to 650°C	extruding after heating to 600-800°C
3rd Step	rolling at 580°C	rolling between 560-620°C
4th Step	final heat treatment of 580°C	final heat treatment between 560-620°C

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-2 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 9 and of US Patent No. 6,863,745. Although the conflicting claims are not identical, they are not patentably distinct from each other because in claim 1 of the instant invention, the zirconium-based alloy composition used for the guide tubes of nuclear reactors as shown US Patent No. 6,863,745 compares to the instant invention as follows:

Element	From Instant Claims	US Patent 6,863,745 (claim 9)	Overlapping range
Fe	-	0.02-1% (200 - 10000 ppm)	
Cr	-	0.01-0.25% w/o V (100 - 2500 ppm)	-
V	-	0.01-0.25% w/o Cr (100 - 2500 ppm)	-
Fe+Cr+V	200 - 700 ppm	400 - 15000 ppm	400 - 700 ppm
Nb	0.8%-1.3%	0.8%-1.3%	0.8%-1.3%
C	less than 100 ppm	less than 100 ppm	less than 100
S	10 - 35 ppm	5 - 35 ppm	10 – 35 ppm
Si	less than 50 ppm	-	0 ppm
O	1100 -1700 ppm	less than 2000 ppm	1100 - 1700 ppm
Zr	remainder	remainder	remainder

It would be obvious that the equation (Nb-0.3)/(Fe + Cr+ V) > 2.5 would be satisfied for the instant invention. For example, if Nb = 0.8%, Fe = 0.02% (200 ppm), Cr = 0.01 (100 ppm), and V = 0%, then the result is 16.67 which is greater than 2.5.

In regards to claim 2 of the instant invention, the zirconium-based alloy compositional comparison is shown above. The comparison of the processes used to

make the zirconium-based alloy are shown for US Patent 6,863,745 and the instant invention are shown below.

	US Patent 6,863,745 (claim 9)	Instant Invention
1st Step	quenching after heating to 1000-1200°C	quenching after heating to 1000-1200 °C
2nd Step	extruding after heating to 600-800°C	extruding after heating to 600-800°C
3rd Step	rolling at 560-620°C	rolling between 560-620°C
4th Step	final heat treatment of 560-620°C	final heat treatment between 560-620°C

If the same composition were subject to the same processing conditions, then an intermetallic compound size not exceeding 200 nm would be expected in both US Patent 6,863,745 and the instant invention. MPEP 2112 III.

Response to Arguments

Applicant's arguments with respect to claim 1-3 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR

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TECHNOLOGY CENTER 1700